SUPERFUND PRELIMINARY CLOSE OUT REPORT

LI TUNGSTEN SUPERFUND SITE

GLEN COVE, NY

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Prepared by

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I. INTRODUCTION

The U.S. Environmental Protection Agency ("EPA") has determined that all construction activities for the Li Tungsten Superfund Site ("Site") have been completed in accordance with *Close Out Procedures for National Priorities List Sites* (OSWER Directive 9320.2-09A-P).

Based upon remedial action field observations, including an August 1, 2008 pre-final inspection by the EPA and New York State Department of Environmental Conservation ("NYSDEC"), and various remedial action documentation; EPA has determined that the remedy has been constructed in accordance with the 1999 and 2005 Records of Decision ("RODs") as modified by the 2002 and 2005 Explanations of Significant Differences ("ESDs"). EPA has also determined that no further response action is necessary, other than monitoring of groundwater and of institutional controls. The Potentially Responsible Parties ("PRPs"), EPA and NYSDEC have initiated the activities necessary to achieve performance standards and site completion. Human exposures and contaminated groundwater releases are under control.

This Superfund site was divided into four operable units ("OUs"). OU-1 consists of a former 26-acre tungsten processing facility ("former facility property"). OU-2 is a nearby 23-acre property known as Captain's Cove where former facility operation wastes were disposed. OU-3 was a separate effort to measure radioactive contamination in buildings which was started in 1997, but cancelled in 1998 and all work subsumed by an EPA removal action. There will be no further reference to OU-3 in this report. OU-4 consists of the portions of Glen Cove Creek which were contaminated with radioactive slag from the former facility operations.

II. SUMMARY OF SITE CONDITIONS

a) Background

The Site is located in the City of Glen Cove in a commercial and industrial area adjacent to Glen Cove Creek, which is an estuary of Hempstead Harbor. The processing of tungsten and other metals began at the former facility property (OU 1), located at 63 Herbhill Road, in 1942 and ended in 1985. Operations consisted mainly of processing tungsten ore concentrates and scrap metal containing tungsten into ammonium paratungstate (APT) and formulating APT into tungsten powder and tungsten carbide

powder. The 26-acre Captain's Cove property (OU 2), located on Garvies Point Road, was used as a dump site for the disposal of incinerator ash, sewage sludge, rubbish, household debris, dredged sediments from Glen Cove Creek, and industrial wastes, including wastes from the Li Tungsten facility, from the 1950's to the late 1970's. The property was purchased by developers in 1983 for development as a residential condominium project. Development efforts were abandoned in the mid-1980's when the NYSDEC designated the Captain's Cove property as a State Superfund site.

EPA added the site to the National Priorities List ("NPL") on October 14, 1992. In 1993, EPA initiated a Remedial Investigation and Feasibility Study ("RI/FS") to define the nature and extent of contamination. OU 1, the former facility property, consists of four property parcels, Parcels A, B, C and C'. Parcel C' was not utilized in facility operations and was not part of the Superfund site remediation. The 23-acre Captain's Cove property (OU 2) is generally bounded by Hempstead Harbor to the west, Garvies Point Preserve to the north, the Glen Cove Anglers' Club to the east, and Glen Cove Creek to the south. A five-acre wetland makes up a portion of the property's southern boundary with the Creek. The portions of the Captain's Cove property and property adjacent thereto which are part of the Li Tungsten Superfund site consist of the areas designated as Areas A, A', G, and G', where ore residuals impacted by radionuclides and heavy metals from the former facility were periodically deposited during the time that the facility operated. EPA originally investigated Captain's Cove with the purpose of potentially adding it to the NPL as a separate Superfund site. EPA subsequently included the Captain's Cove property to the Li Tungsten Superfund site in 1995 after investigation and sampling confirmed that the ore residuals disposed of at Captain's Cove likely originated from former facility operations.

Glen Cove Creek (OU 4) is a mile-long tidal creek discharging into Hempstead Harbor. The Creek was channelized in the early 20th century by the US Army Corps of Engineers ("USACE"), who continue to maintain it as a Federal navigational channel. Commercial and industrial properties, marinas, a sewage treatment plant, and vacant Superfund and Brownfields properties presently abut the Creek along its length.

b) Removal Actions

There have been three actions at this Site that have been performed through the Superfund Removal Program. These actions are separate and distinct from the remedial actions which were also carried out at the Site by the Removal Action Branch ("RAB"), which normally performs Superfund removal actions. The removal actions that have been carried out have included both Fund-lead as well as Potentially Responsible Party ("PRP") lead, with EPA oversight.

Following is a brief listing and description of the Superfund removal actions at the Site:

* On July 21, 1989, EPA signed an Administrative Order on Consent ("AOC") with the current owner of the Li Tungsten facility property, the Glen Cove Development Corporation ("GCDC"), for the performance of a removal action at the Li Tungsten former facility. Activities performed by GCDC included addressing radioactive

materials, removing drummed chemicals and laboratory reagents, addressing a mercury spill, and sampling, analyzing, and inventorying work. Work pursuant to the Order was completed in July 1990. This work has been documented through the EPA On-scene Coordinator's ("OSC's") issuance of Pollution Reports ("POLREPS").

* EPA performed a second major removal action from October 1996 to October 1998, primarily to address the hazards associated with the remaining Li Tungsten tank wastes. This removal action resulted in the disposal of large volumes of waste liquid and sludge from 271 process and storage tanks, primarily on Parcel A, as well as removal and disposal of asbestos and other hazardous chemicals found at the former facility. EPA also demolished two structures on Parcel A, i.e., the Dice Complex and the East Building, because of the physical dangers posed by their structural instability and in order to facilitate access to tanks. This work has been documented through the OSC's issuance of POLREPS.

* EPA issued a Unilateral Administrative Removal Order ("UAO") on August 14, 2001 directing certain PRPs to segregate Creek sediments contaminated with radionuclide slag. These sediments had been dredged by the USACE in 2000 and placed on Parcel A for dewatering prior to re-use in accordance with the City of Glen Cove's Beneficial Use Determination ("BUD"), issued by NYSDEC. The entrained radioactive slag was discovered while dredging was underway, forcing suspension of all dredging activity. Pursuant to the UAO, TDY Industries, Inc. ("TDY"), the performing PRP, segregated radioactive slag from the sediments on Parcel A in summer 2002. The remediation was performed by methodically spreading and instrument-screening six-inch lifts of dewatered sediments, followed by manual removal of any materials exhibiting radiation greater than specified criteria. Afterwards, the City disposed of the remaining non-radioactive sediment at the North Hempstead Landfill for use as grading material pursuant to the earlier BUD, and the segregated radioactive materials were secured in the Dickson Warehouse on Parcel C for eventual off-site disposal. This work has been documented through the OSC's issuance of POLREPS, as well as a report by TDY's contractor, Earth Sciences Consultants, Inc., entitled *Segregation and Management of Dredged Spoils,* October 2002.

c) Records of Decision/Explanations of Significant Differences

There have been two RODs and two ESDs for the Li Tungsten site.

1) <u>September 30, 1999 ROD</u>

The 1999 ROD included the soil and groundwater remedy for both the former facility property (OU 1) and Captain's Cove (OU 2). The components of the selected soil remedy for OUs 1 and 2 included:

- Excavation of soils and sediments contaminated above cleanup levels;
- Separation of radionuclide-contaminated soil from non-radionuclide soil contaminated with heavy metals;

- Off-Site disposal of both radionuclide and metals-contaminated soil at appropriately licensed facilities;
- Off-Site disposal of radioactive waste located in the Dickson Warehouse at an appropriately licensed facility;
- Building demolition at the Li Tungsten facility;
- Storm sewer and sump cleanouts at the Li Tungsten facility;
- Institutional controls governing the future use of the Site;
- Decommissioning of Industrial Well N1917 on Parcel A; and
- Collection and off-site disposal of contaminated surface water from Parcels B and C.

The selected groundwater remedy included no action, other than a long-term groundwater monitoring program to assess the recovery of the Upper Glacial Aquifer after the soil remedy is implemented.

2) March 30, 2005 ROD

The 2005 ROD included the remedy for radionuclide slag in Glen Cove Creek (OU 4). The major components of the selected remedy for OU 4 included:

- Construction of a dewatering facility on the Li Tungsten property;
- Two phases of Creek dredging to remove radioactive slag materials;
- Dewatering of the dredged sediment followed by segregation of slag from the dewatered sediment; and
- Off-site transportation and disposal of the radioactive slag at an appropriately licensed facility.

3) November 2002 ESD

After excavation work was underway, it became apparent that the ROD's estimates of volumes requiring excavation were too low. The EPA issued an ESD for the Site in November 2002 which provided estimated increases in projected volumes of wastes requiring excavation pursuant to the 1999 ROD, from 69,350 cubic yards ("cy") to 132,100 cy.

Actual volumes reported in the Remedial Action Reports ("RARs") for OU 1 and OU 2 show that approximately 158,000 cy of contaminated soils were ultimately excavated and disposed off-site. The greater discrepancy between estimated and actual soil excavation volumes occurred at Captain's Cove, partly because the stockpiling of contaminated soils for an extended period of time resulted in additional soils beneath the stockpiles being contaminated as a result.

4) May 2005 ESD

In May 2005, EPA issued another ESD to re-evaluate the 1999 ROD's cleanup criteria in order to address the City of Glen Cove's decision to revise the Glen Cove Creek

waterfront revitalization plan to include residential future use of the Site. EPA determined that the ROD's radiation criteria needed some revision, but that the arsenic and lead criteria were sufficiently protective of future residential use and need not be revised. The ESD also reserved judgment on the residential future use of Parcel A because of the possibility that contaminants other than those included in the ROD's cleanup criteria could pose a threat to future residential populations.

The 2005 ESD also described the impact of the changes in the radiation cleanup criteria on areas previously excavated during OU 1 and OU 2. After reviewing post-excavation confirmatory results, EPA was satisfied that the previous excavations had met the new radioactive cleanup criteria, as well as the heavy metals criteria (which hadn't changed). EPA proceeded to notify the PRPs that during implementation of remedial actions on the northern half of the former facility property, the new radioactive criteria must be met during post-excavation confirmatory sampling. EPA also applied these new criteria to the disposal of the stockpiled contaminated soils at Captain's Cove in 2005, i.e., after loading and disposal of the piles, the "footprints" of the removed piles were required to meet the new criteria.

d) Remedial Actions

As described earlier, the remedial actions that have been performed at this Site have been organized into 3 OUs. The remedy for OUs 1 and 2 (the former tungsten facility and Captain's Cove, respectively) were addressed in the 1999 ROD, while the remedy for OU 4 (radionuclide slag in Glen Cove Creek) was addressed in the March 2005 ROD. The following is a brief narrative of the manner in which EPA completed each OU for the Li Tungsten site.

1) <u>OU 1</u>

The remedial tasks comprising OU 1 were performed by both EPA and TDY, the performing PRP. EPA's activities, informally dubbed "Phase 1" of OU 1, were centered on the remediation of the southern half of Li Tungsten; i.e., Parcel A and lower Parcel C (south of the Dickson Warehouse). TDY's OU 1 activities targeted the remainder of the former facility property - that is, upper Parcel C, including the Dickson Warehouse and the remainder of Parcel C north and west of the Warehouse, as well as Parcel B.

i) EPA Excavation Work at Former Facility Property (Phase 1)

EPA's 1999 ROD envisioned that the implementation of the selected remedy would allow redevelopment of the Li Tungsten Superfund site in substantial conformance with the City's Glen Cove Creek Revitalization Plan. At the time, the accelerated placement of the former facility and Captain's Cove properties back into a commercially viable scenario would also meet the primary objective of EPA's "Recycling Superfund Sites" initiative. Soon after the issuance of the ROD, EPA initiated a fund-lead response to expedite the soil remedy for Phase 1, then defined as Parcel A, lower Parcel B and lower Parcel C. The estimated volume of soil requiring excavation in these areas was

estimated at approximately 5,000-6,000 cubic yards ("cy"), a disproportionately small volume of the former facility's contaminated soils. The southern portion of the former facility property was also a very significant part of the City's Creek revitalization plan.

Therefore, in February 2000, EPA mobilized the RAB and its contractor, Earth Tech, to the Site to perform Phase 1 of OU 1. The Phase 1 scope of work specifically included: the excavation of all soil and sediment exceeding the ROD cleanup criteria in the Phase 1 project area; demolition of the Carbide Building and Lab/Office/Wire Building complex and segregation and decontamination, if possible, of radioactive building debris; staging of excavated soil and building debris that exceeded radioactive cleanup criteria in the Dickson Warehouse for future offsite disposal by PRPs; disposal of any non-radioactive, heavy metals-contaminated soil as well as non-radioactive building debris at appropriate off-site disposal facilities; sampling/analysis to confirm excavations had met cleanup criteria; flushing, collection and disposal of contaminated sediments from storm sewers under the Phase 1 remediation area; and decommissioning of industrial well N1917 on Parcel A.

After work was initiated, subsequent increases in volume estimates and remediation costs caused EPA to reconsider the scope of Phase 1; resulting in EPA's decision to terminate Phase 1 after Parcel A and lower Parcel C had been remediated. Implementation of the remainder of OU 1, involving excavation of contaminated soil, sediment, and ore residuals from Parcel B and upper Parcel C, was anticipated to be performed by PRPs at a future date.

After excavation was completed in an area, post-excavation sampling for radiation and heavy metals would then be performed utilizing field instrumentation with verification from an outside laboratory. If the bottom of the excavation was contaminated, excavation would continue until cleanup criteria were achieved or the water table was encountered. If the water table was encountered before meeting heavy metals criteria, the excavation would then be backfilled as long as radiation criteria had been met. The rationale for this field protocol was that arsenic and lead contamination below the water table fell within the ROD's "no action" determination for groundwater. On the other hand, if radiation criteria had not been met at the water table, the excavation would continue below the water table until criteria were met. The rationale for removing radioactively contaminated soil below the water table was to eliminate the long-term potential for radon gas issues in future site structures. This "water table" protocol was also in effect during EPA's excavation work at Captain's Cove and TDY's excavation work at the former facility property.

On August 2, 2001, a final inspection of the completed remediation for Phase 1 was conducted at the Site. Present were EPA's OSC Mark Pane and remedial project manager Ed Als. Based on the inspection, EPA believes that the remedial measures implemented during Phase 1 by EPA's RAB were fully completed and in conformance with the 1999 Record of Decision. The Phase 1 remedial action was summarized in EPA's *Interim Remedial Action Report for Operable Unit 1 – Parcel A + Lower Parcel C: Excavation and Offsite Disposal of Contaminated Soil*, dated September 28, 2001.

This interim RAR was in turn based on POLREPs 1 through 43, issued by the EPA's OSC and covering the period of time from February 21, 2000 through May 4, 2001.

ii) TDY Disposal of Dickson Warehouse Contents and Limited Excavation on Upper Parcel C

EPA issued a UAO to all PRPs at the Site on September 29, 2000 to perform the remedial actions described in the 1999 ROD, other than that work performed by EPA as part of Phase 1. In August 2003, EPA specifically ordered TDY, the lead PRP for performance of work at the Site, to initiate the remainder of OU 1 work by first removing and disposing of radioactive materials staged in the Dickson Warehouse from EPA's earlier remedial investigation and Phase 1 remedial action operations. TDY's contractor, Environmental Chemical Corp ("ECC") loaded and shipped approximately 5,180 tons of radioactively contaminated soils and ore residuals from the Dickson Warehouse to US Ecology in Idaho. During this action, TDY requested that EPA broaden its approval of the project work plans to allow for some excavation, transportation, and disposal of radioactively-contaminated soils located on upper Parcel C and Parcel B. ECC thereupon excavated and shipped an additional 3,527 tons of radiation-contaminated soils from Upper Parcel C to US Ecology. The TDY OU 1 work was performed from January 26th through March 5th, 2004 and is fully described in ECC's report prepared for TDY and entitled *Final Interim Remedial Action Report, Post-Remedial Actions at Dickson Warehouse and Upper Parcel C, Li Tungsten Superfund Site, Glen Cove, New York* (ECC) and dated November 2004.

iii) TDY Completion of Excavation and Disposal Work at Former Facility Property

TDY's contractor ECC re-mobilized to the Site on June 25, 2006, to complete the scope of work for OU 1. TDY planned its excavation strategy for meeting the ROD cleanup criteria, as revised by the 2005 ESD, based on protocols described in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) for radiological contaminants of concern, and on EPA publication SW-846 (Chapter 9) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" for metals contaminants and polychlorinated biphenyls (PCBs).

TDY initiated excavation work on Parcel B and then proceeded to upper Parcel C. After excavation, all non-radioactive, heavy-metals contaminated soils were directly loaded onto trucks for disposal at the GROWS/Tullytown facility in Pennsylvania. Other contaminated waste streams, i.e., radioactive soils, RCRA-hazardous waste soils, and PCBs-contaminated soils, were staged in the Dickson Warehouse for specialized handling and disposal.

TDY completed all excavation work on Parcel B and upper Parcel C in July 2007. Parcel B and upper Parcel C stabilization, grading and seeding operations were completed by the end of July, whereupon ECC demobilized from the Site.

The completion of the Parcel B and upper Parcel C excavation and disposal work performed by ECC is fully described in ECC's draft RAR prepared for TDY and dated August 2008.

iv) TDY Disposal of Dickson Warehouse Contents and Warehouse Decontamination

TDY remobilized to the Dickson Warehouse in November 2007 using a new contractor, URS. At this point, TDY was operating pursuant to the global Consent Judgment which had been entered in Federal Court on October 29, 2007. The scope of work generally included disposal of the stockpiled radioactive, RCRA-hazardous, and PCB-contaminated soils staged in the Warehouse, as well as testing and decontamination of the Warehouse itself.

The PCBs stockpile was shipped on November 12, 2007 to Wayne Disposal in Belleville, Michigan for disposal. Radiological contaminated soil was shipped from November 13 through November 20 to US Ecology in Grand View, Idaho for disposal. The RCRA-hazardous soils, which were contaminated with lead and classified as "D008" wastes, were first stabilized with Calciment i.e., lime, inside the Dickson Warehouse prior to disposal during May/June 2008 at the GROWS/Tullytown facility in Morrisville, Pennsylvania.

The decontamination of the Dickson Warehouse began on June 4th and was completed on July 25th, 2008. Radiologically elevated areas of the Warehouse were identified and remediated through employment of various techniques for removal of contaminated building materials, including removal of sections of the roof that proved too difficult to decontaminate. These contaminated materials also were shipped to US Ecology for disposal.

The emptying and decontamination of the Dickson Warehouse is fully described in URS's draft RAR prepared for TDY and dated August 2008.

On August 1, 2008, a final inspection of the completed remediation for TDY's portion of OU 1 was conducted at the Site. Present at the inspection were the following personnel:

Ed Als, Remedial Project Manager (EPA)
George Harris, Section Chief (NYSDEC-Albany)
Rich McInerney, Construction Oversight Manager (US Army Corps of Engineers)
Edgard Bertaut, Performing Settling Defendant Technical Representative (TDY Industries, Inc)
Jeff Calarie (URS Corporation)
Andy Lombardo (SEC Corporation)
Steve Cabrera (Dvirka and Bartilucci, on behalf of City of Glen Cove)
Mike Posillico (RexCorp/Glen Isle)
Ellis Koch (RexCorp/Glen Isle)
Darren Monti (RexCorp/Glen Isle)

Reuben Twersky (RexCorp/Glen Isle)
Zeb Youngman (PW Grosser)
Lisa Santoro (PW Grosser)

Based on this inspection, EPA believes that all remedial measures implemented during TDY's remediation of Parcel B and upper Parcel C, including the decontamination of the Dickson Warehouse, were fully completed and in conformance with the 1999 Record of Decision, as revised by the 2005 ESD. EPA's and TDY's remedial actions for OU 1 are summarized in EPA's *Remedial Action Report for Operable Unit One (Li Tungsten Facility) Li Tungsten Superfund Site, Glen Cove, Nassau County, New York,* September 2008.

2) OU 2

i) EPA Excavation and Staging of Contaminated Soils at Captain's Cove

The RAB mobilized its contractor Earth Tech, Inc. to the Captain's Cove property in January 2001 to perform the remedial actions required there under the 1999 ROD. RAB's mobilization and excavation activities required coordination with the City of Glen Cove and the State of New York, who were jointly excavating the central portion of Captain's Cove at that time pursuant to the State Superfund program.

EPA proceeded first with excavation of Area A, followed by Area G. Two ancillary areas, known as Areas A' and G' because of their locations adjacent to the main areas of contamination, were then excavated. Finally, two small contaminated areas i.e., less than 1,000 cy each, which had not been previously excavated because of logistical issues, were excavated last. These last two areas are discussed under "Exempt Areas", below.

Following excavation of an area, post-excavation sampling for radiation and heavy metals would then be performed utilizing field instrumentation with verification from an outside laboratory. If the floor of the excavation was contaminated, excavation would continue until cleanup criteria were achieved or the water table was encountered i.e., the "water table" excavation protocol described earlier for OU 1. Following receipt of satisfactory lab results, the excavations would be backfilled with certified clean fill and compacted.

After excavation work was completed at Area A, all subsequent excavation work was performed by a new RAB contractor, WRS Environment and Infrastructure, Inc.

After RAB completed the excavation, staging and interim stabilization of contaminated soil piles at Captain's Cove in November 2003, EPA issued the May 2005 ESD explaining the changes to the 1999 ROD. As part of the ESD process, EPA included its rationale for changing the radiation cleanup criteria and described the impact of these changes on areas previously excavated during OU 1 and OU 2. After reviewing all the post-excavation confirmatory results, EPA determined that the previous excavations had

satisfactorily met the new radioactive cleanup criteria as well as the heavy metals criteria, as described earlier.

All Captain's Cove waste soils, that had been excavated during 2001-2003 by EPA's RAB, were staged in ten stockpiles on the Captain's Cove portion of the property. RAB had segregated these waste soils, originally estimated to be 112,000 tons, into five stockpiles of radioactive waste and three stockpiles of non-radioactive, heavy-metals contaminated waste. The remaining two stockpiles contained concrete and wood debris. Relatively small amounts of mixed waste and RCRA-hazardous waste were also identified during characterization activities.

The EPA's RAB excavation and stockpiling work at Captain's Cove is fully described in the following documents:

> POLREPs No. 1 through No. 30, issued by the EPA's OSC and covering the period of time from December 4, 2000 through April 30, 2003
>
> *Li Tungsten - Captain's Cove Site Remediation Summary Report,* issued by the EPA's OSC in May 2003
>
> *EPA Final Status Report: USEPA Superfund Project/WRS E & I, Deadman Areas, Captain's Cove, Glen Cove, NY* (RASI) May - July 2003
>
> *EPA XRF Analysis Report for the Li Tungsten Site, Area G Prime* (Weston Solutions, Inc.) January 2004

ii) EPA Remediation of Localized "Exempt Areas"

In October 2003, RAB re-mobilized to Glen Cove and excavated five localized, contaminated "pockets" within the Phase 1 and Captain's Cove areas in October/November 2003. These areas had initially been "exempted" because of logistical difficulties encountered during Phase 1 and the Captain's Cove excavations. Approximately 3,200 cubic yards of contaminated soil was excavated from these areas and staged on Captain's Cove with the other stockpiled soils for later disposal.

The EPA's RAB remediation and post-excavation sampling work for these five areas is described in the *Addendum to Li Tungsten - Captain's Cove Site Remediation Summary Report, Data Summary Tables for Miscellaneous Remediated Areas* (November/December, 2003) prepared by the EPA's OSC.

iii) USACE Transportation and Disposal Activities at Captain's Cove

In August 2004, EPA entered into an Interagency Agreement (IAG) with the USACE to dispose of the stockpiled waste soils at Captain's Cove. Stockpile load-out, transportation and disposal activities commenced in February 2005 when the USACE

mobilized to Captain's Cove, utilizing Conti Corp. as its prime contractor. Work included installing a truck scale, sampling of waste materials for waste classification, loading stockpiled radioactive soil into lined intermodal containers and metals-contaminated soil and debris into tarped dump containers and trucks, breaking up and disposing of concrete debris (primarily from the demolition of former condominium foundations), and some grading of the Site at completion of load-out. Sediment and erosion controls were also employed while the load-out work was in progress.

The USACE's transportation and disposal activities at Captain's Cove is fully described in the *Remedial Action Report, Remedial Action Operable Unit 2 (Captain's Cove Property)* (Conti E and I, Inc.) June 2006

On November 22, 2005, a pre-final inspection of the completed remediation for Captain's Cove - OU 2 was conducted at the property. Present at the inspection were:

Ed Als - EPA Remedial Project Manager
Shewen Bian - USACE Contracting Officer representative
Dean Hall - Conti Corp. Project Manager
Bruce Baita - Conti Corp. Site Superintendent
Bob Landle - Conti Corp.Quality Control Manager/Site Safety Officer

Several days prior to this inspection, the City's Commissioner of Public Works, Nick DeSantis, also inspected the property in the company of the USACE. Another inspection was performed on July 19, 2006 by Ed Als of EPA and George Harris, a Section Chief in the Division of Environmental Remediation, NYSDEC.

Based on these inspections, the EPA believes that all remedial activities implemented during OU 2 were fully completed and in conformance with the requirements of the 1999 Record of Decision, as revised by the 2005 ESD. The July 19, 2006 inspection was deemed a final inspection. The OU 2 remedial actions performed by EPA and USACE are summarized in EPA's *Remedial Action Report For Operable Unit 2 (Captain's Cove Property), Excavation and Offsite Disposal of Contaminated Soil, Li Tungsten Superfund Site, Glen Cove, Nassau County, New York* September 2006.

3) <u>OU 4</u>

i) USACE Dredging of Acceptance Areas

In September 2005, EPA entered into an IAG with the USACE to perform the dredging portion of the remedy described in the 2005 ROD. The USACE had produced a remedial design and bid specifications for EPA under an earlier IAG. USACE initiated on-site construction activities in October 2006 by mobilizing its contractor, WRS, to the Site.

To organize dredging operations, Glen Cove Creek was first divided into four lengths, called "Acceptance Areas." Site preparation included mobilization of field offices and

equipment; dewatering accumulated water on Parcel A; limited clearing and grubbing; installation of two dewatering cells, erosion controls, crane staging areas, access roads, and perimeter fencing; and abandonment of one on-site monitoring well. Access to the Creek and management of creek traffic was coordinated with the Glen Cove Creek Harbor Master and Glen Cove Creek Community Development Agency.

Dredging began on November 7, 2006 and was accomplished mechanically by means of a crane equipped with a clamshell bucket. First, dredging would proceed to the navigational depth, which is a minimum depth of 8 feet below mean low water ("MLW") throughout a given acceptance area. A bathymetric survey would then confirm that navigational depth had been achieved, after which a radiological gamma survey would be performed by subcontractors CDM/Cabrera, usually while dredging was taking place in the next acceptance area. The gamma survey would locate and mark any "hot spots" i.e., gamma radiation in excess of 2X background, within the navigationally dredged acceptance area. Background radiation in Creek sediment was defined as 1,747 counts per minute (CPM), based on earlier field sampling performed during the remedial design. Computer-assisted design and drafting (CADD) drawings for the hot spot areas were downloaded into the dredging GPS system, with the hot spot dredging locations displayed on the GPS display screen so that the dredge operator could properly locate the hot spot areas for dredging. Individual hot spots would then be dredged to a maximum depth of 11 feet MLW, within an areal extent of 25 square feet i.e., a five-foot square centered on a given hot spot. Close groupings of hot spots would sometimes result in overlapping dredge squares, in which case the outer perimeter of the resulting shape would define the hot spot area. Resulting dredged material, whether it was generated as a result of the navigational phase or the hot spot dredging phase, was loaded into scows for transport to the dewatering cells on Parcel A. There the scows were emptied by means of a crane and the dredged sediments placed into a dewatering cell.

Acceptance area 4 was the easternmost acceptance area, near the headwaters of the creek. Because it was unlikely that radioactive slag would be found there, this area was considered to be outside the response authority of the Superfund program. Therefore, the USACE funded the navigational dredging of this area. All four acceptance areas were dredged and a final bathymetric survey performed in the last week of February 2007. The final estimated dredged volume was approximately 28,000 cy.

The USACE's dredging activities in Glen Cove Creek with subsequent placement of dredged sediments upland onto Parcel A is fully described in the *USACE Kansas City District Final Remedial Action Report, Li Tungsten Superfund Site, Operable Unit 4 – Glen Cove Creek, Glen Cove, NY,* (CDM) October 2007.

ii) TDY Segregation of Slag from Dewatered Sediments

TDY, operating pursuant to the September 2000 UAO, mobilized its contractors, URS and SEC, to Parcel A in August 2007 to begin preparations for segregating radionuclide slag from the dewatered sediments. Segregation work started on September 3, 2007, and typically involved spreading and radiologically scanning 6-inch layers of sediment in a

prepared laydown area within Parcel A. Initial lifts of material were small, eventually approaching the maximum size (2,000 square meters) of a MARSSIM Class 1 survey unit as the project progressed and more laydown area became available.

The survey laydown area would then be surveyed at 100-percent surface coverage with field survey meters. The meters can respond to radiation emitted from a depth of 6 inches, the depth that was maintained in the survey laydown area. Specific searches for discrete pieces of material or accumulations of material that exceeded the detection criteria were performed during the survey. The above action level ("AAL") material identified during the survey was physically segregated and staged in a 55-gallon drum for subsequent disposal.

At the completion of segregation activities in November 2007, URS and SEC had radiologically scanned 31,374 cy of dewatered sediment. This quantity was approximately 12% more than the anticipated quantity of 28,000 cy. One fifty-five gallon drum of radionuclide-contaminated slag was moved to the Dickson Warehouse and staged with other radioactive wastes for eventual disposal at US Ecology. The disposal of the remainder of the remediated dredged material on Parcel A is the responsibility of the City of Glen Cove.

The segregation of radionuclide slag from the dewatered dredge material is fully described in URS's draft RAR prepared for TDY and dated August 2008.

iii) RAB Dredging of Hot Spots Along Parcel A Bulkhead and Bulkhead Repairs

In February of 2007 a post-radiation survey of the dredged acceptance area in front of Parcel A by CDM/Cabrera had indicated the presence of additional hot spots in the Creek's north sideslope, adjacent to the bulkhead. As directed by EPA, USACE did not pursue these hot spots at that time because of their proximity to the bulkhead and the possibility of extensive bulkhead collapse. EPA's RAB mobilized to Parcel A in October 2007 with ERRS contractor WRS, to complete dredging of these hot spots using a long reach excavator from land. This work was completed between October 15 and October 25, 2007. Subsequently, RAB also contracted for repairs to a 135-foot stretch of Parcel A bulkhead which collapsed during a storm in April 2007. RAB mobilized to the Site in May 2008 and completed the replacement of the damaged bulkhead by the end of July 2008.

RAB's dredging of the hotspots near the bulkhead and the bulkhead repairs is described in POLREP 1 (from October 15 to October 25, 2007) and POLREP 2 (from October 26, 2007 to July 25, 2008) issued by the EPA's OSC; and F*inal Technical Memorandum, Gamma Verification Survey for Acceptance Area 3 (AA3), Li Tungsten Superfund Site, Operable Unit 4, Glen Cove, NY* (Cabrera Services) May 2008.

All OU 4 work was inspected on August 1, 2008. Besides the individuals listed above for the August 1, 2008 OU 1 inspection, the following personnel were also in attendance at the OU 4 portion of the inspection:

Scott Garpiel – WRS
Andrew Likos - WRS

Based on the inspection, EPA believes that the remedial measures implemented during the USACE's navigational and hot spot dredging of Glen Cove Creek, TDY's dewatering and segregation of radionuclide-contaminated slag from the dewatered sediments, and RAB's hot spot dredging of the north sideslope in front of Parcel A and subsequent bulkhead repairs were fully completed and in conformance with the 2005 Record of Decision. The OU 4 remedial action is summarized in EPA's DRAFT *Remedial Action Report For Operable Unit Four (Radionuclides in Glen Cove Creek), Li Tungsten Superfund Site, Glen Cove, Nassau County, New York* DRAFT September 2008.

e) Institutional Controls

While some institutional controls will be needed to prevent exposures in certain areas of the Site where contaminants have been left in place above levels which allow for unlimited use/unrestricted exposure, none have been implemented as yet. The present owner of the Li Tungsten OU 1 and OU 2 properties is the Glen Cove Industrial Development Agency ("IDA"). EPA intends to have discussions with the IDA in order to develop appropriate institutional controls for the following cases:

Parcels A, B, C and Environs - all excavation work during OU 1 by EPA, or by TDY with EPA oversight, occurred primarily in the vadose (unsaturated) zone above the water table. Radionuclide contamination encountered at the water table would continue to be excavated, but non-radioactive, heavy metals contamination would not. Little, if any, radioactive soils contamination was encountered below the water table, with the result that minimal excavation occurred below the water table. Therefore, there are sporadic occurrences of heavy metals contamination below the water table (as well as volatile organic chemicals ("VOCs") from a nearby State Superfund site contaminating groundwater under Parcel A) which must preclude the use of, or exposures to, groundwater in the area of the Li Tungsten site. A groundwater monitoring program will be performed by TDY for 5 years at both OU 1 and OU 2 to monitor the progress of groundwater improvement now that the overlying contaminated soils have been removed.

Parcel A - during Phase 1 excavation work, Parcel A was remediated to the ROD cleanup criteria for commercial future use. The 2005 ESD recognized that while other portions of the Li Tungsten site could be used for residential future use if they were excavated to the modified cleanup criteria, Parcel A may have unacceptable levels of polycyclic aromatic hydrocarbons ("PAHs") or possibly other contaminants that could preclude unrestricted residential use. Post-excavation confirmatory sampling has demonstrated that the overall cleanup performed during OUs 1 and 2 will permit residential use on these properties, with the continued exception of Parcel A, which is still deemed suitable for commercial or industrial future use, as per the 1999 ROD.

A small area in the southwest corner of Parcel A may still have concentrations of arsenic above the water table that marginally exceed cleanup criteria, based on post-excavation data. Future intrusive activities in this area should take this possibility into account.

PCB Area on Parcel B - the area denoted as the PCB dumping area in the middle of Parcel B was excavated and the PCBs removed. Samples were then collected and based upon the results, it was determined that the alternative sitewide cleanup level of 10 mg/kg for below 2 feet grade could be applied to the upper northern portion of the PCB area which did not meet the ROD clean-up criteria for surface soils. The PCB remedial area was covered with 2 feet of clean backfill over the upper northern portion and the lower southern half was not covered. The 2 feet of clean cover must be maintained over the upper northern portion in order to meet the ROD clean-up standard.

Side Wall Along Western Edge of Parcel C - as part of the Upper Parcel C excavation, ECC surveyed the side wall area of the excavation west of the Dickson Warehouse at 10-meter grid nodes with an XRF unit. These survey results showed significant arsenic and lead contamination. This "line" of arsenic and lead contamination is an extension of the line of elevated arsenic and lead contamination running along the western edge of lower Parcel C, encountered by EPA during Phase 1.

In both cases, it was determined that further excavation along this line of heavy metals contamination was infeasible because of the existing utility and infrastructure present within the immediate area, i.e., less than 2 feet, beyond the fence line i.e., primarily two storm drain systems and underground electric services. In the area west of the Dickson Warehouse, TDY's contractor ECC physically separated the contaminated area by covering it along its length with 15-mil puncture resistant poly sheeting. After the poly sheeting was installed, it was covered with clean fill.

Northeast corner of Lower Parcel C - Arsenic contamination was left above cleanup criteria in the vicinity of a gas line along a short stretch of Garvies Point Road, abutting the east side of lower Parcel C.

Radionuclides in north sideslope of Glen Cove Creek – EPA's RAB dredged a small area in the sideslope along the north bulkhead of Parcel A in October 2007 that still showed residual levels of radiation after the dredging project had been completed earlier that year. These two adjacent hot spots, designated 1 and 2, became one hot spot as the dredging proceeded. Dredging proceeded in the sideslope to a depth approximately equal to 11 feet below MLW, which is the depth to which dredging of hot spots was terminated during the earlier dredging project, due to its being below the maximum navigational dredging depth of 8 feet + two feet overdredge below MLW. Further dredging was also ruled out because of the possibility of undermining the bulkhead. Gamma radiation at the point dredging was halted was still quite elevated, indicating radioactive slag was still present. The sideslope was then backfilled to the approximate grade of the slope.

Radionuclides below navigational depth in the Creek channel – although the Creek's navigational channel has been effectively "cleared" of radionuclides that could otherwise impact future navigational dredging operations, it is possible that radioactive slag could still be found below navigational depth in the Creek. The only certain location that has been documented in this regard is hot spot 1 and 2 in the sideslope along the Parcel A bulkhead, described immediately above.

In general, future construction work has to take into account the above "legacies" of this Superfund Site; therefore, it will be necessary to devise institutional constraints that will effectively minimize human exposures to these residual contaminants.

f) Redevelopment Potential of Site

The Site resides on approximately 50 acres of waterfront property in Glen Cove, which is part of Long Island's "Gold Coast", so-called because of the great wealth of those who have historically settled along that part of the north shore of Long Island. The Site is split into two roughly equal areas bordering Glen Cove Creek, i.e., Captain's Cove at the western end of the Creek and the former Li Tungsten facility property about a half mile east of Captain's Cove near the head of the Creek. The area around the Creek was one of the first settlements in the New World, with a European history of settlement dating back to the 1640's. The former facility property has been used for various industrial purposes over the years, but in recent times developers have become interested in turning land around the Creek into a more "showcase" usage to take advantage of the scenic waterfront. Both "Seaport-style" commercial as well as residential usages have been envisioned for the Li Tungsten Site since the 1980's, but the environmental scars left by many years of industrial use have created several brownfields and Superfund sites along the one-mile stretch of the Creek. The City, the State of New York, and EPA have been addressing the cleanups of these properties for years. But the two Li Tungsten properties clearly form the "linchpin" in the estimated $1 billion redevelopment plan to revitalize the Creek area with improved infrastructure, 860 condominiums, Hotel, Theater and Arts Center, and Ferry Terminal providing water transportation among Glen Cove, Connecticut and lower Manhattan. EPA's cleanup of the Li Tungsten site is intended to support residential future use, with the present exception of Parcel A, which EPA has not fully evaluated for a change from the ROD's assumption of a commercial future use, as per the 2005 ESD. EPA will re-evaluate Parcel A's suitability for residential future use at the written request of the City. The City of Glen Cove and its development group have recently intensified their meeting schedule with local, State and Federal Agencies to plan and coordinate the next steps, now that the Site is about ready for re-use.

III. DEMONSTRATION OF CLEANUP ACTIVITY QUALITY ASSURANCE AND QUALITY CONTROL

All activities at the Site were consistent with the two RODs as well as the 2005 ESD, which modified the cleanup criteria for OUs 1 and 2. Subsequent documents, such as remedial designs and remedial action work plans (including Quality Assurance Project

Plans, Health and Safety Plans, Sampling and Analysis Plans, etc) were also consistent with the remedies described in the RODs.

a) 1999 ROD cleanup criteria

The 1999 ROD included the following cleanup criteria:

Parameter (In Soil)	Cleanup Levels
Arsenic (soil)	24 mg/kg
Arsenic (sediment)	6 mg/kg
Lead (soil)	400 mg/kg
Lead (sediment)	31 mg/kg
Thorium-232	5 pCi/g[1]
Radium-226	5 pCi/g[1]
PCBs in mid Parcel B	1 mg/kg in top 2 feet
PCBs in mid Parcel B	10 mg/kg below top 2 feet

[1] These cleanup levels do not include the natural background radiation of each radionuclide i.e., approximately 1 pCi/g.

1) Revised 2005 ESD radiation criteria

These criteria were further modified by the following language in EPA's May 2005 ESD:

"Based on a re-evaluation of the ROD's cleanup levels, vis-a-vis residential future use, EPA has determined that only the radionuclides need to be further restricted in soil. Consistent with EPA's OSWER Directive 9200.4-25, which further defines the provisions of 40 CFR 192 for Superfund sites, the following radiological criteria will apply to the OU1/OU2 cleanup:

radium-226 + radium-228 ≤ 5pCi/g + background

thorium-230 + thorium-232 ≤ 5 pCi/g + background"

The ESD further states:

"Post-excavation sampling of the boundaries excavated by EPA (*i.e.*, the entire Captain's Cove portion of the Site, as well as Parcel A and lower Parcel C of the Li Tungsten property) show that not only the original cleanup criteria, but also the modified radionuclide criteria have been met; therefore, EPA has determined that the areas of the Site that have been excavated to date meet residential standards for arsenic, lead, and radionuclides."

b) Remedial design for Parcel B and Upper Parcel C

A final remedial design for TDY's excavation and off-site disposal of contaminated soils from Parcel B and Upper Parcel C was completed in January 2002 by TDY's contractor, URS.

c) OU 1 and OU 2 inspections

Final inspections and RARs for all OU 1 and OU 2 activity have been described earlier in **II**, and together document the completion of these OUs in conformance with the 1999 ROD, 2005 ESD, and all subsequent implementing documents.

d) 2005 ROD cleanup criteria

The 2005 ROD cleanup criteria for dewatered sediments included the following:

radium-226 + radium-228 - sum not to exceed 5 p Ci/g + background
thorium-230 + thorium-232 - sum not to exceed 5 pCi/g + background

The 2005 ROD also utilized a "2X" background standard for radionuclide contamination in the Creek.

e) *Remedial design for Creek dredging*

A final remedial design was completed by the USACE under an IAG with EPA in April 2006 for the dredging component of OU 4, including design of the dewatering cells on Parcel A. CDM was retained by USACE to perform the remedial design.

f) OU 4 inspection

A final inspection and Remedial Action Report for all OU 4 activity has been described earlier in **II**, and together document the completion of this OU in conformance with the 2005 ROD and all subsequent implementing documents.

IV. ACTIVITIES AND SCHEDULE FOR COMPLETION

EPA's first activity at this Site was providing oversight of the 1989 removal action performed by GCDC. See the attached *Administrative and Response Action Milestones*, which documents the history of EPA's Superfund response at this Site.

The RA activities that remain to be completed for this Site include implementation of a five-year groundwater monitoring plan and the placement of institutional controls as needed. The groundwater monitoring plan will initially involve sampling five wells quarterly in the first year for the contaminants of concern, and annually thereafter. Three of the wells are from the existing well network, and have been previously assessed to

confirm their integrity. Two additional wells were drilled in September 2008. To commence the groundwater monitoring program, the five-well network will be sampled at the end of September 2008.

The Final Close-out Report and NPL deletion process will commence once the necessary institutional controls are in place and the five-year groundwater monitoring program has been completed.

Task	Estimated Completion	Responsible Organization
Prepare OU 1 RA Report	September 2008	TDY/EPA
Prepare OU 4 RA Report	September 2008	TDY/EPA
Implement Institutional Controls	December 2008 - June 2009	City of Glen Cove/EPA
Perform GW Monitoring Program	September 2008 - September 2013	TDY/EPA
Prepare/Approve Final Closeout Report	September 2009	EPA
Perform Five-year Review	August 2010	EPA
NPL Deletion	September 2013	EPA

V. SUMMARY OF REMEDIATION COSTS

The original capital costs described in the two RODs to implement the remedial actions for this Site are:

a) 1999 ROD

The estimated capital cost of both soil and groundwater portions of the OU 1 and OU 2 remedy that was outlined in Table 18 of the ROD was **$28,146,200**. The 30-year total present worth cost, including the implementation of the groundwater monitoring program, was **$28,764,200**.

EPA published a November 2002 Explanation of Significant Differences when it became apparent that the volumes of contaminated soils requiring excavation had been underestimated in the 1999 ROD. The ESD provided new volume estimates which

almost doubled the expected volume of soils requiring off-site disposal, from approximately 69,400 cubic yards to approximately 132,100 cubic yards. However, the ESD stated that because of changes in off-site disposal costs, primarily of radioactive materials, these new volume estimates would result in a new estimated cost for the OU 1 and OU 2 remedy in the range of **$30-40 million.**

The following actual obligation and cost information is derived from records that were issued subsequent to work being completed for OU 1 and OU 2:

OU 1 EPA Parcel A and Lower Parcel C – **$4,368,000** (contracts, modifications, and EPA intramural costs)

OU 1 PRP remedial actions on Parcel B and Upper Parcel C – unknown (see N.B., below)

OU 2 USACE/EPA Captain's Cove - **$31,375,000** (contracts, modifications, and USACE intramural costs)

b) 2005 ROD

The estimated capital cost of the OU 4 remedy that was outlined in Table 18 of the 2005 ROD was **$2,979,269**, which is also the 30-year present worth cost. This estimate did not include disposal of remediated sediments, which was the City of Glen Cove's responsibility.

The following actual obligation and cost information is derived from records that were issued subsequent to work being completed for OU 4:

OU 4 USACE dredging contract - **$2,969,815** (contracts, modifications, and USACE intramural costs)

OU 4 PRP segregation work – unknown (see N.B., below)

OU 4 EPA sideslope hot spot dredging and bulkhead restoration - **$603,000** (contracts, modifications, and EPA intramural costs)

[N.B.: The OU 1 and OU 4 work that EPA directed TDY to complete was estimated by EPA and TDY jointly to cost $10.7M when the Consent Judgment was lodged in early 2007. This estimate does not include the OU 1 work that TDY performed in early 2004 to empty the Dickson Warehouse and to perform limited excavation work on Upper Parcel C. Actual expenditures for any of the work performed by TDY on either OU 1 or OU 4 was not provided to EPA for this report].

VI. FIVE-YEAR REVIEW

EPA selected a remedy that removed contaminated soil from approximately fifty acres of land and radioactive slag from the adjacent Glen Cove Creek. EPA published a Five-year Review in August 2005, approximately five years after the start of the first remedial action at the Site. Statutory Five-year Reviews will be required to evaluate the groundwater monitoring program as well as the effectiveness of the institutional controls that will be implemented to control certain conditions where wastes have been left in place above unlimited use/unrestricted exposure criteria. The next statutory Five-year Review will be in 2010.

George Pavlou, Acting Director
Emergency and Remedial Response Division

9/25/08
Date

LI TUNGSTEN SUPERFUND SITE

Timeline	Major Administrative Milestones (not including Orders and Agreements with Potentially Responsible Parties)	CERCLA Remedial/Removal Actions
1989		*1989-1990* - EPA's oversight of PRP performing emergency Superfund removal action at the abandoned Li Tungsten property
	October 1992 - EPA lists Li Tungsten property on the National Priorities List, making it a federal Superfund site	
	November 1995 - EPA adds Captain's Cove property to Li Tungsten site, due to Li Tungsten disposal activity there	*1993-1998* - EPA remedial investigation and feasibility study of the Captain's Cove and Li Tungsten properties
		1996 - USACE navigationally dredges outer half of Creek
		1996-1998 – EPA Superfund removal action –removes 271 tanks/contents from the Li Tungsten property + several buildings
	March 1999 - NYSDEC ROD for the chemical contamination at Captain's Cove *i.e.,* addresses all other contamination except the Li Tungsten ore residuals.	
	September 1999 - EPA's first ROD, for the Li Tungsten and Captain's Cove properties, OUs 1 and 2	
		May 2000 – August 2001 – NYSDEC/City State ROD implementation -> landfill reclamation completed at Captain's Cove.
		January 2000 – August 2001 - EPA 1st ROD excavation work completed on Li Tungsten Parcel A and lower Parcel C
		September 2000 – May 2001 – USACE navigationally dredges inner half of Creek, radioactive slag is found, dredging is suspended.
	November 2002 - EPA's first ESD, changing 1999 ROD volume estimates for off-site disposal.	*January 2001 – November 2003* – EPA 1st ROD excavation work completed at Captain's Cove. Wastes staged for off-site disposal.
		January – April 2004 - TDY disposal of radioactive wastes staged in Dickson Warehouse
		February 2005 – July 2006 – USACE off-site disposal of contaminated wastes staged at Captain's Cove
	March 2005 – EPA's second ROD, for remediation of Glen Cove Creek radioactive slag (OU 4)	
	May 2005 - EPA's second ESD, for changes to the 1999 ROD as a result of future land use change	
		July 2006 – TDY mobilization to complete 1st ROD remedy for Li Tungsten Parcels B and Upper C
		October 2006 – USACE mobilization to complete 2nd ROD implementation for Creek radioactive slag
		October 2007 - Dredging of Creek, including dewatering, dredge segregation and radioactive slag disposal, completed
2008		*August 1, 2008* – remedial action for Li Tungsten Parcels B and Upper C completed; site stabilization along bulkhead completed.